

Wall hung, fan flue, room sealed, high efficiency gas boiler

# **TROUBLE SHOOTING MANUAL EN**

Models:

**15B**

**15C**

**30B**

**30C**

**30K**

**40C**

**TWIN80C** (partly)

COOPRA Advanced Heating Technologies b.v.  
Vierlinghstraat 14  
NL 3316 EL, Dordrecht  
Tel: +31 (0) 78 – 653 08 30  
Fax: +31 (0) 78 – 653 08 33

## Table of contents

### 1. Overall information

|      |                             |   |
|------|-----------------------------|---|
| 1.1. | Overall view.....           | 3 |
| 1.2. | Hydraulic diagram           |   |
| 1.3. | Nomenclature.....           | 4 |
| 1.4. | Cover removal               |   |
| 1.5. | Emptying the main circuit   |   |
| 1.6. | Emptying the d.h.w. circuit |   |
| 1.7. | Control panel               |   |
| 1.8. | Condensate trap route.....  | 5 |

### 2. Checks, servicing and replacement of components

|       |  |    |
|-------|--|----|
| 2.1.  | Fan, gas valve and venturi assembly..... | 6  |
| 2.2.  | Burner.....                              | 7  |
| 2.3.  | Pump                                     |    |
| 2.4.  | Main circuit pressure sensor.....        | 8  |
| 2.5.  | Flow water temperature sensor            |    |
| 2.6.  | Return water temperature sensor.....     | 9  |
| 2.7.  | D.h.w. heat exchanger sensor             |    |
| 2.8.  | Three-way diverter valve.....            | 10 |
| 2.9.  | C.h. pressure relief valve.....          | 12 |
| 2.10. | Electronic control p.c.b.                |    |
| 2.11. | Display                                  |    |
| 2.12. | Glow plug and ionisation rod.....        | 13 |
| 2.13. | D.h.w. heat exchanger.....               | 13 |

### 3. FAULT FINDING

|       |  |  |
|-------|--|--|
|       | Burner states                                |  |
|       | Pump test (each boiler start)                |  |
|       | Temperature test (each boiler start)         |  |
|       | Pump monitoring (during operation)           |  |
|       | System water pressure monitoring (operation) |  |
| 3.1.  | Stand-by                                     |  |
| 3.2.  | Pre-rinse                                    |  |
| 3.3.  | Ignition                                     |  |
| 3.4.  | In operation                                 |  |
| 3.5.  | Post-rinse                                   |  |
| 3.6.  | Pump afterrun                                |  |
| 3.7.  | Burner is on                                 |  |
| 3.8.  | Burner is off                                |  |
| 3.9.  | Display                                      |  |
| 3.10. | Blocking                                     |  |
| 3.11. | Lock-out                                     |  |

### 3.12. STATUS INDICATIONS

All known indications listed:

|                          |                            |                   |
|--------------------------|----------------------------|-------------------|
| 1                        | .....                      | flashing          |
| 1                        | .....                      | continuous        |
| 1.                       | .... (1+dot)               | continuous        |
| 2                        | .....                      | flashing          |
| 2                        | .....                      | continuous        |
| 2.                       | .... (2+dot)               | continuous        |
| 3                        | .....                      | flashing          |
| 4                        | .....                      | flashing          |
| 4                        | .....                      | continuous        |
| 4.                       | .... (4+dot)               | continuous        |
| 5                        | .....                      | flashing          |
| 6                        | .....                      | flashing          |
| 7                        | .....                      | flashing          |
| 8                        | .....                      | flashing          |
| 9                        | .....                      | flashing          |
| 9                        | .....                      | continuous        |
| A                        | .... (large A)             | flashing          |
| A                        | .... (large A)             | continuous        |
| A/C.                     | .... (large A/C+dot)       | continuous        |
| A/d.                     | .... (large A/d+dot)       | continuous        |
| A/b.                     | .... (large A/b+dot)       | continuous        |
| b/r                      | .... (small b/r)           | continuous        |
| Chimney sweeper function |                            |                   |
| C                        | .... (large C)             | flashing          |
| C                        | .... (large C)             | continuous        |
| d                        | .... (small d)             | continuous        |
| b                        | .... (small b)             | continuous        |
| J                        | .... (large J)             | continuous (TWIN) |
| C                        | .... (large C)             | continuous (5x)   |
| C.                       | .... (large C+dot)         | continuous        |
| d.                       | .... (small d+dot)         | continuous        |
| b.                       | .... (small b+dot)         | continuous        |
| c                        | .... (small c)             | continuous        |
| E                        | .... (large E)             | flashing          |
| E                        | .... (large E)             | continuous (TWIN) |
| F                        | .... (large F)             | flashing          |
| H                        | .... (large H)             | flashing          |
| H                        | .... (large H)             | continuous        |
| h                        | .... (small h)             | continuous        |
| nc                       | .... (small nc)            | continuous        |
| O                        | .... (large O)             | flashing          |
| O                        | .... (large O)             | continuous        |
| o                        | .... (small o)             | continuous        |
| o.                       | .... (small o+dot)         | continuous        |
| P                        | .... (large P)             | continuous        |
| P                        | .... (large P+pump test)   | continuous        |
| P                        | .... (large P)             | continuous (2x)   |
| P/C.                     | .... (large P/large C+dot) | continuous        |
| P/d.                     | .... (large P/small d+dot) | continuous        |
| P/b.                     | .... (large P/small b+dot) | continuous        |
| U                        | .... (large U)             | continuous        |

## Chapter 1: Overall information

### 1.1. Boiler types

80C, 40C, 30K, 30B, 30C, 15B, 15C

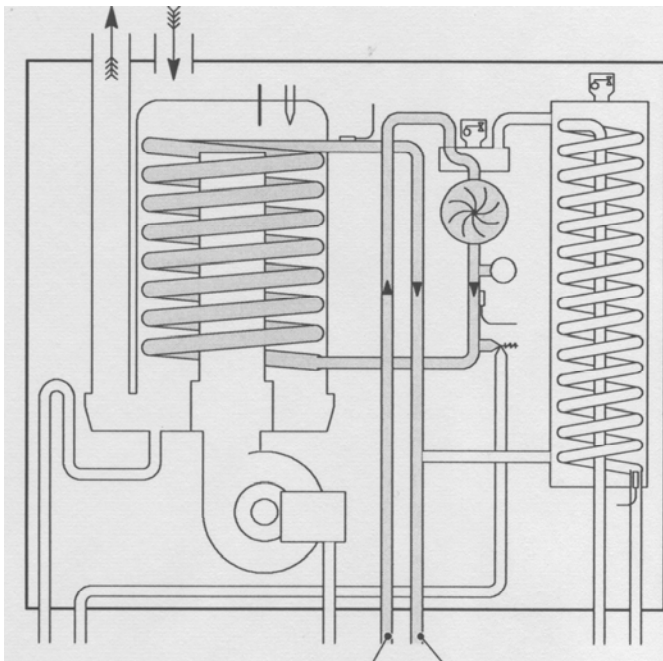


Combi boiler 30K

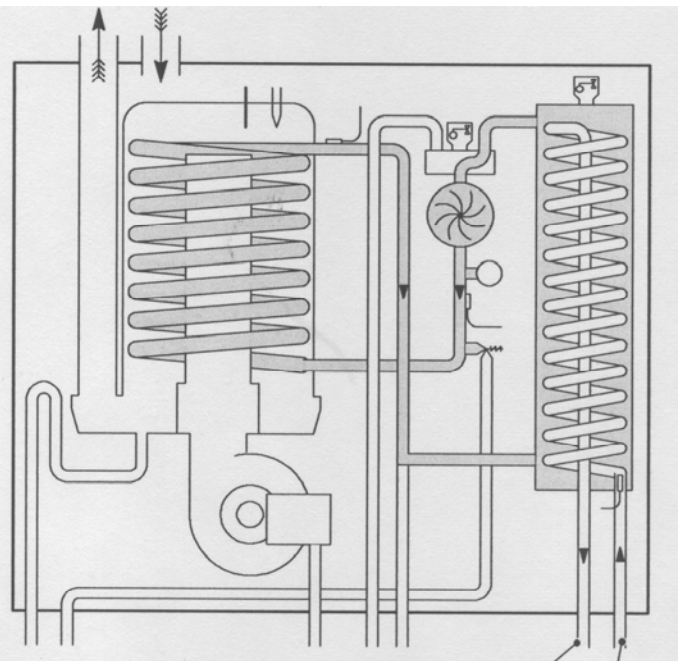


TWIN80C

### 1.2. Hydraulic diagram of Combi boiler



Heating operation



Hot water operation

### 1.3. Nomenclature

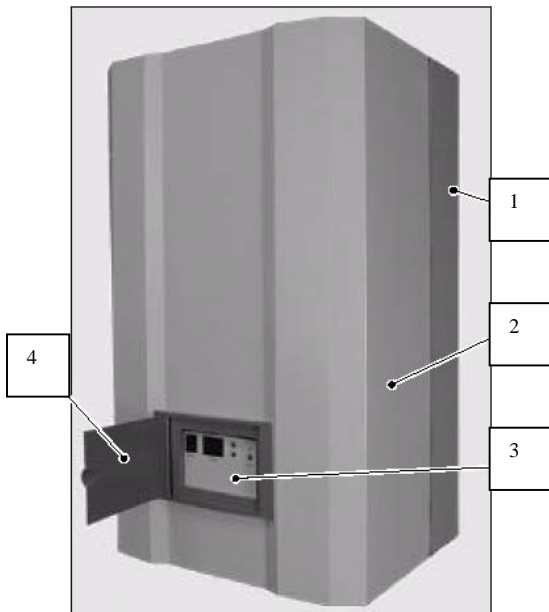


Fig 2

- |   |                     |
|---|---------------------|
| 1 | Frame               |
| 2 | Cover               |
| 3 | Control panel       |
| 4 | Control panel cover |

### 1.4. Cover removal

**⚠ Warning:** isolate the boiler from the mains electricity supply before removing any covering or component.

For all the checks and maintenance operations it is necessary to remove the cover.

To remove the cover:

1. Turn the hexagonal nut F (fig 3) counter-clockwise and free the hook from the boiler frame.

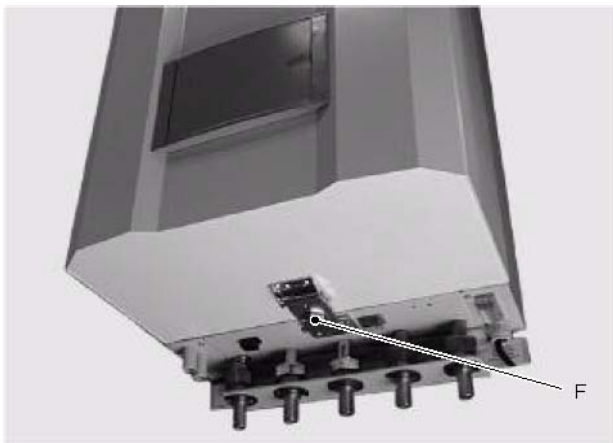


Fig 3

2. Pull the bottom of the cover until the control panel is completely out of the cover, then lift the cover and free it from the hooks G (fig 4) placed on the top of the boiler.
3. Re-assemble in reverse order.

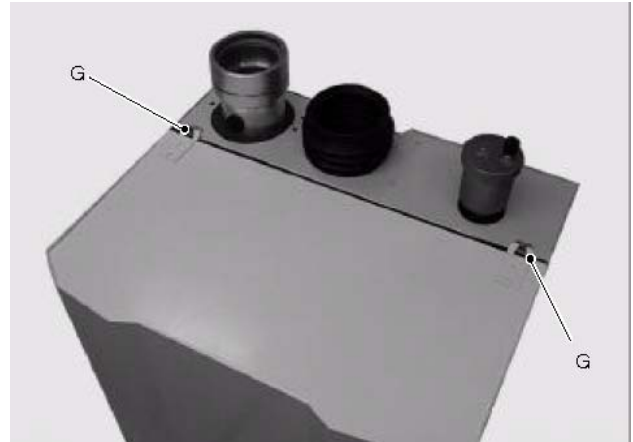


Fig 4

### 1.5. Emptying the main circuit

1. Open the c.h. flow and return valves.
2. Open the control valve used for the filling of the c.h. circuit drain cock and drain the boiler.
3. Drain completely the boiler by turning the knob of the fill and relief valve.

### 1.6. Emptying the direct hot water circuit

Turn off the d.h.w. inlet isolating valve; turn on the hot water taps and any drain cocks.

### 1.7. Control panel

**⚠ Warning:** isolate the boiler from the mains electricity supply before removing any covering or component.

To gain access to the parts located behind the control panel proceed as follows:

- 1 Remove the cover (section 1.3).
- 2 Remove the screw H (fig 5) and lower the control panel.

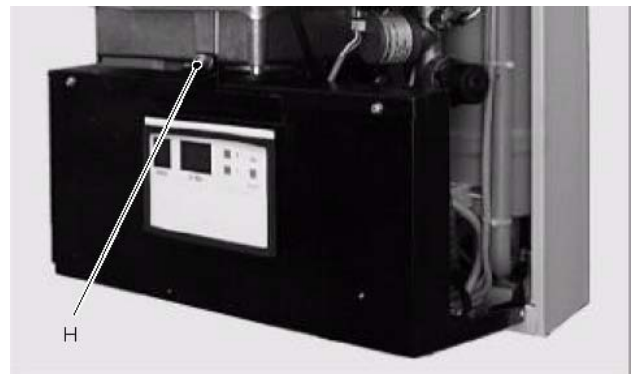


Fig 5

To gain access to the parts located inside the control panel proceed with steps 1 and 2 than:

3 Remove the screws I (fig 6).

4 Remove the lid J

5 Re-assemble in reverse order.

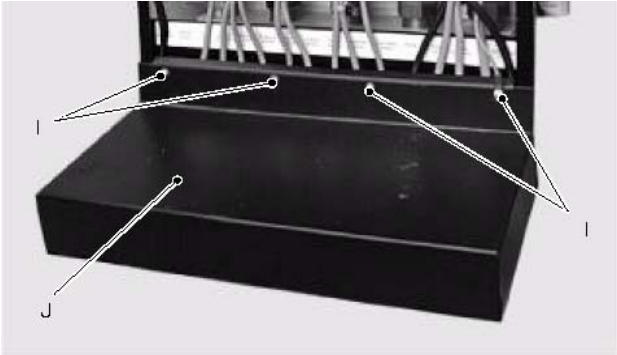


Fig 6

### 1.8. Condensate trap route

The plastic pipe K (fig 7) that connects the condensate collector with the condensate drain pipe has also the function of condensate trap.

For this reason, if the pipe K needs to be removed during service operations, it is very important to re-install routing it as shown in figure 7.

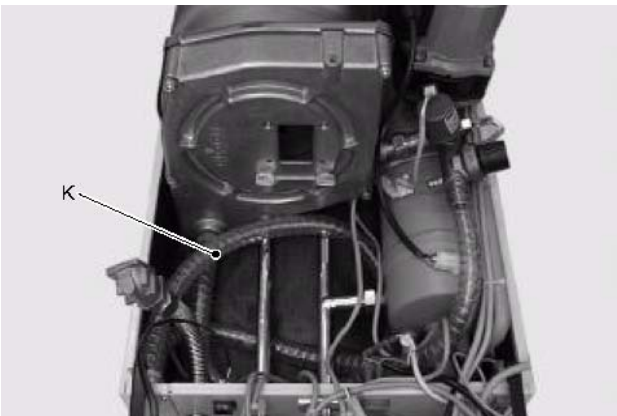


Fig 7

## Chapter 2: Checks, servicing and replacement of components

### 2.1. Fan, gas valve and venturi assembly

The function of the fan is to force the mixture of air and gas into the burner.

The flow rate of the air-gas mixture and consequently the input power of the boiler is proportional to the speed of the fan that is controlled by the electronic control p.c.b. The venturi assembly A placed on the inlet port of the fan allows the mixing of gas and air in the right proportion. The gas-air ratio can be adjusted by the venturi screw B (fig 8).

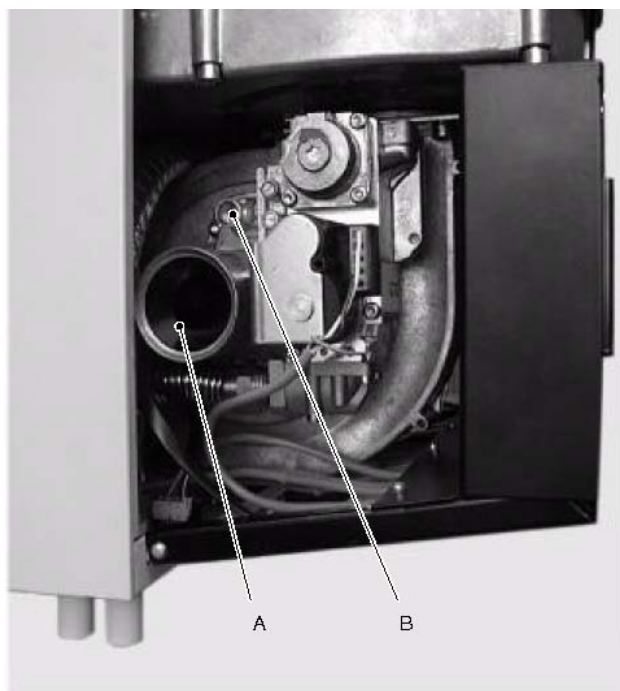


Fig 8

#### F Removal of the assembly

**Warning:** isolate the boiler from the mains electricity supply before removing any covering or component.

- 1 Remove the cover (section 1.4).
- 2 Close the gas inlet valve.
- 3 Lower the control panel (section 1.7).
- 4 Disconnect the wirings from the fan C and gas valve D (fig 9).
- 5 Unscrew the Allen key screws E and separate the gas connection F from the gas valve.
- 6 Unscrew the Allen key screws G and the bracket H.

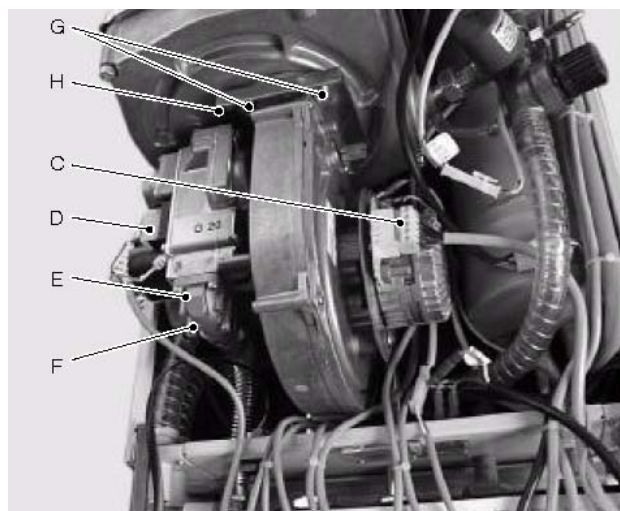


Fig 9

7 Remove the fan with the venturi assembly and the gas valve.

8 To separate the fan from the venturi assembly and gas valve unscrew the screws I (fig 10).

9 To separate the gas valve from the venturi assembly unscrew the screws J.

10 Re-assemble the parts following the removal procedures in the reverse order.

Replacing the parts replace also the gaskets that ensure the gas circuit tightness.

If the venturi assembly has been replaced, before to start the boiler ensure that the venturi screw B (Fig. 8) is completely tighten (clockwise) then carry out a complete adjustment as explained in the installation manual.



**Warning:** After cleaning or replacement as detailed above refer to section Combustion adjustment check in the chapter Commissioning of the installation instructions manual.

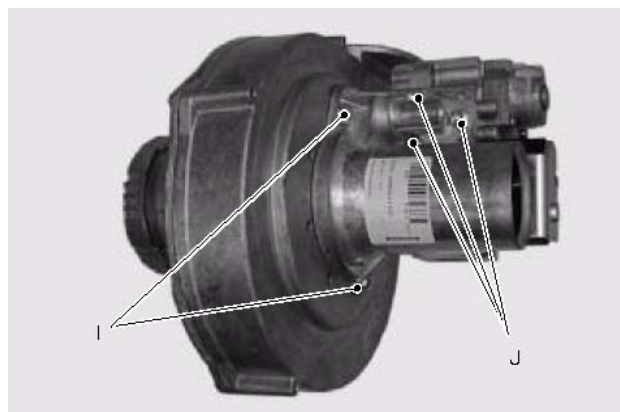



Fig. 10



## 2.2. Burner

### F Removal of the burner assembly

 **Warning:** isolate the boiler from the mains electricity supply before removing any covering or component.

- 1 Remove the cover (section 1.4)
- 2 Close the gas inlet gas cock.
- 3 Remove the fan, gas valve and venturi assembly (section 2.1).
- 4 Remove the condensate connection pipe A (Fig. 11).
- 5 Unscrew the five Allen key screws B and lower the condensate collector C that holds the burner.
- 6 To remove the burner from the condensate collector unscrew the Allen Key screws D (Fig. 12).
- 7 Re- assemble the parts following the removal procedures in the reverse order.

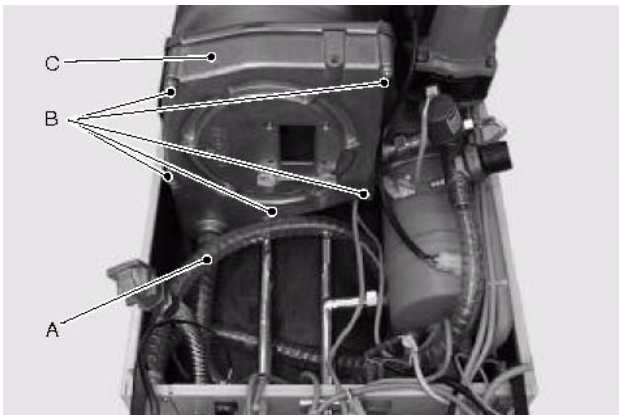


Fig. 11

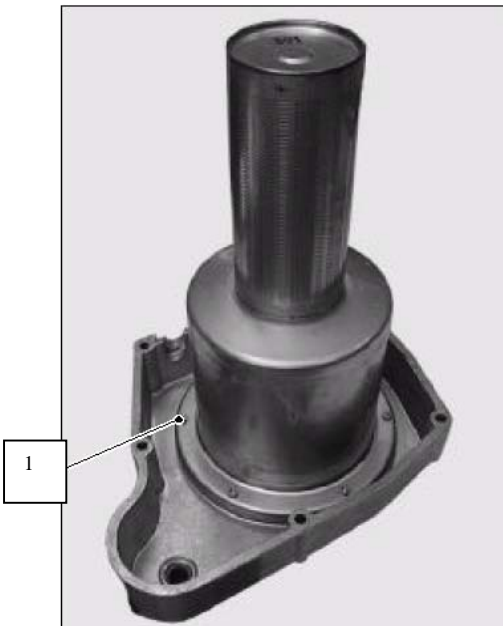


Fig 12

### F Removal of internal turbulators

To remove the turbulators placed inside the burner remove the burner as explained in the previous section and unscrew the screw E (Fig. 13).

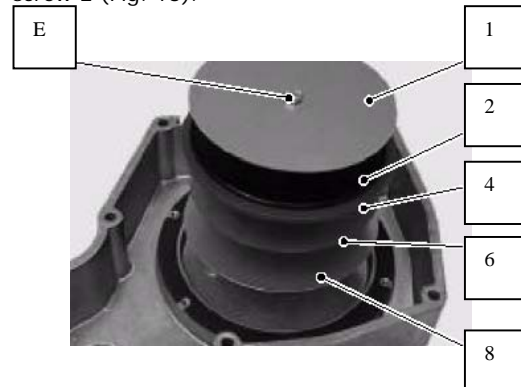


Fig 13

Follow the indications given in Fig. 13 and Fig. 14 to re-assemble correctly the turbulators.

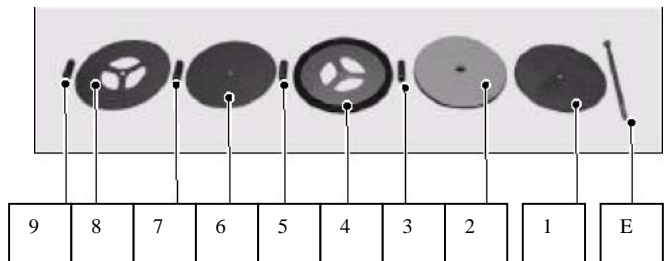



Fig 14

The disk 6 is thinner than the disk 1.


All the spacers (3, 5, 7 and 9 in Fig. 14) have the same length.

 **Warning:** After cleaning or replacement as detailed above refer to section Combustion adjustment check in the chapter Commissioning of the installation instructions manual.

## 2.3. Pump

The pump has the function of making the water in the main circuit circulate through the main heat exchanger and therefore through the c.h. system (during the c.h. function) or through the d.h.w. heat exchanger (during the d.h.w. function).

### F Removal

 **Warning:** isolate the boiler from the mains electricity supply before removing any covering or component.

- 1 Remove the cover (section 1.4)
- 2 Empty the main circuit (section 1.5)
- 3 Lower the control panel (section 1.7)
- 4 Disconnect the connector A (Fig. 15).
- 5 Unscrew the Allen screws B and remove the pump.
- 6 Re- assemble the parts following the removal procedures in the reverse order.

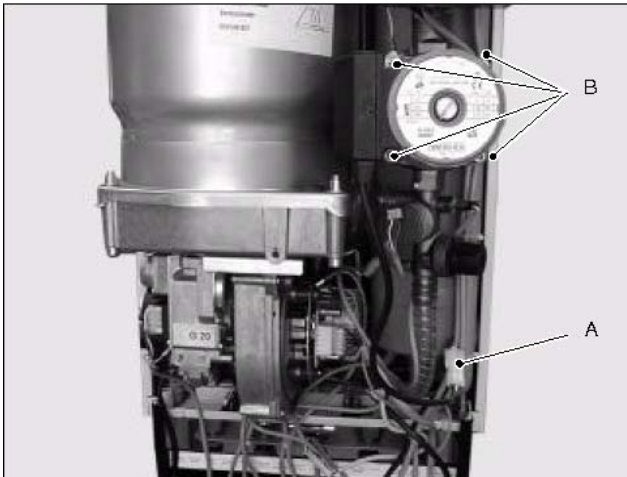



Fig. 15

#### 2.4. Main circuit pressure sensor

The main circuit pressure sensor is connected to the outlet port of the pump and translates the pressure of the main circuit to an electrical signal.

##### F Removal

 Warning: isolate the boiler from the mains electricity supply before removing any covering or component.

- 1 Remove the cover (section 1.4)
- 2 Empty the main circuit (section 1.5)
- 3 Lower the control panel (section 1.7)
- 4 Disconnect the connector A (Fig. 16).
- 5 Unscrew the sensor B.
- 6 Re-assemble the parts following the removal procedures in the reverse order.

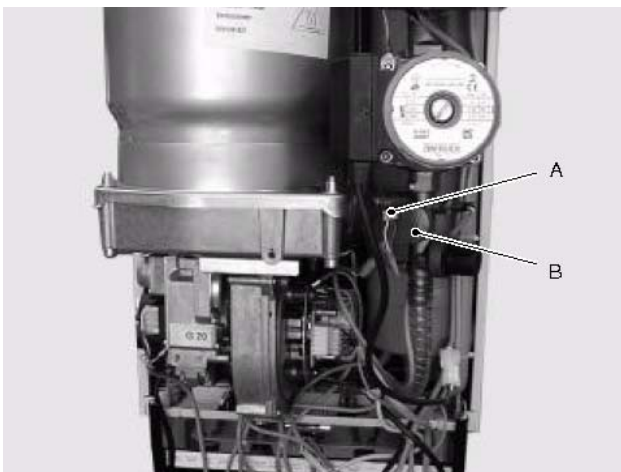



Fig. 16

#### 2.5. Flow water temperature sensor


The flow temperature sensor has the function of converting the temperature of the water flowing in the outlet pipe of the main heat exchanger into an electric signal (resistance).

##### F Check

 Warning: isolate the boiler from the mains electricity supply before removing any covering or component.

- 1 Remove the cover (section 1.4).
- 2 Disconnect the connectors A (Fig. 17).
- 3 Measure the resistance between the leads of the sensor. At a normal temperature of 25 °C the resistance should be about 12 kOhm.

##### F Removal

 Warning: isolate the boiler from the mains electricity supply before removing any covering or component.

- 1 Remove the cover (section 1.4).
- 2 Disconnect the connectors A (Fig. 17).
- 3 Remove the temperature sensor
- 4 Re-assemble the sensor following the removal procedures in the reverse order.

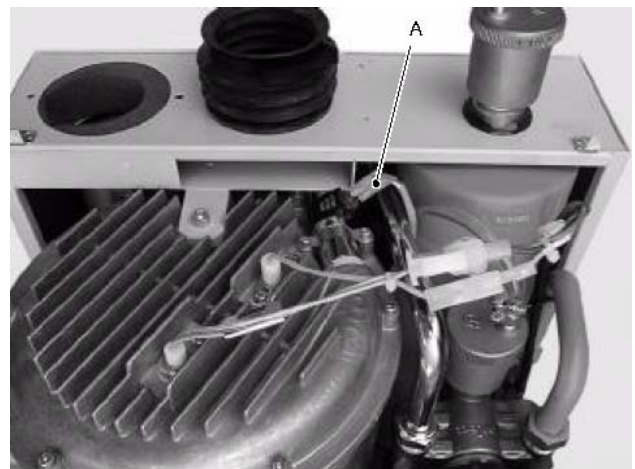



Fig. 17



## 2.6. Return water temperature sensor


The return temperature sensor has the function of converting the temperature of the water flowing in the inlet pipe of the main heat exchanger into an electric signal (resistance).

### F Check

 Warning: isolate the boiler from the mains electricity supply before removing any covering or component.

- 1 Remove the cover (section 1.4).
- 2 Disconnect the connector A (Fig. 18).
- 3 Measure the resistance between the leads of the sensor. At a normal temperature of 25 °C the resistance should be about 12 kOhm.

### F Removal

 Warning: isolate the boiler from the mains electricity supply before removing any covering or component.

- 1 Remove the cover (section 1.4).
- 2 Empty the main circuit (section 1.5)
- 3 Lower the control panel (section 1.7)
- 4 Disconnect the connector A (Fig. 18).
- 5 Unscrew and remove the temperature sensor.
- 6 Re-assemble the sensor following the removal procedures in the reverse order.

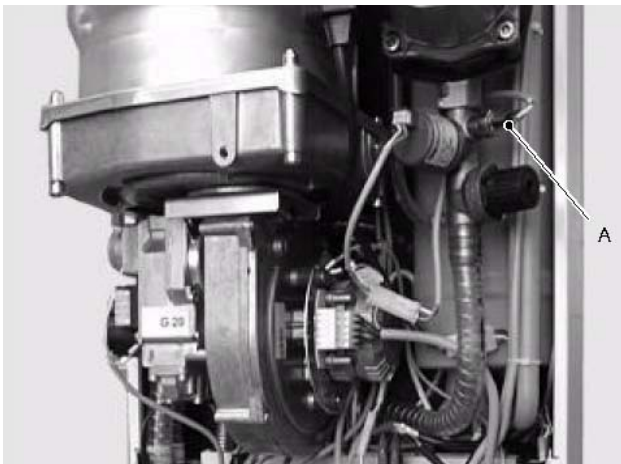


Fig. 18


## 2.7. D.h.w. heat exchanger temperature sensor

The d.h.w. heat exchanger temperature sensor is placed in the domestic cold water inlet pipe of the exchanger.

It has two functions:

- 1 when there is no d.h.w. draw off it senses the temperature of the exchanger and operates the boiler in order to keep the water at the desired temperature (d.h.w. hold temperature).
- 2 when there is d.h.w. draw off it senses the temperature change of the exchanger and operates the boiler in d.h.w. mode.

### F Removal

 Warning: isolate the boiler from the mains electricity supply before removing any covering or component.

The sensor is not in direct contact with the water so it isn't necessary to empty the d.h.w. circuit.

- 1 Remove the cover (section 1.4)
- 2 Unscrew the screws A and move away the plate B (Fig. 19).



- 3 Disconnect the sensor from the control panel wiring.
- 4 Remove the holder spring C (Fig. 20) and extract the sensor.
- 5 Re-assemble the sensor following the removal procedures in the reverse order.

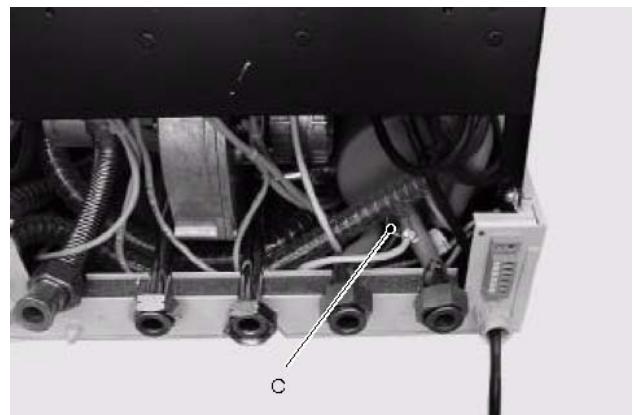


Fig. 20

Re-assembling the sensor use an adequate quantity of thermal conductive grease and insert the sensor in the jacket until it reaches the top.

## 2.8. Three-way diverter valve

The three-way valve has the function of modifying the hydraulic circuit of the boiler by means of an electric command given by the electronic control p.c.b. in order to send the water that comes from the c.h. system or from the d.h.w. heat exchanger towards the pump and the main heat exchanger.

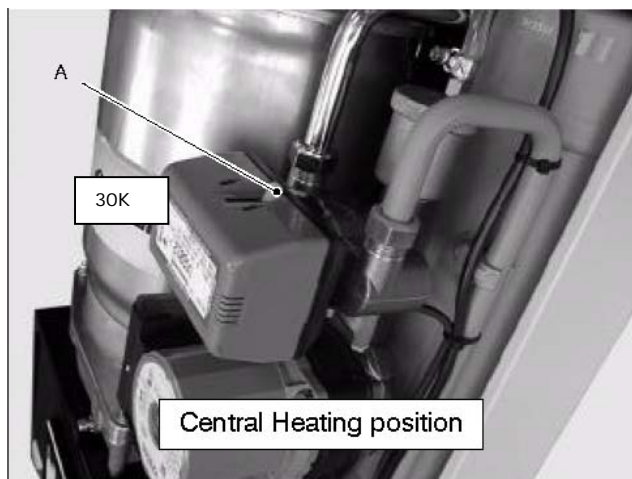


Fig. 21

On the motor body an indicator is visible with which it is possible to know the position of the diverter valve.

Fig. 21 and Fig. 22 indicate the relationship between the positions of the indicator A and the consequent hydraulic function.

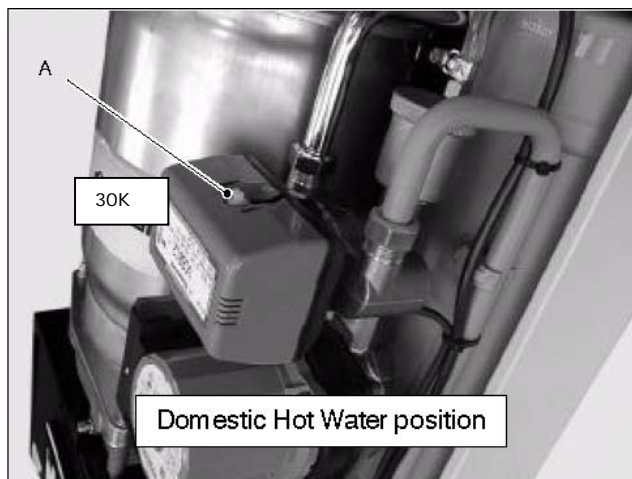


Fig. 22

### F Check of electrical completeness


 Warning: isolate the boiler from the mains electricity supply before removing any covering or component.

Fig. 23 demonstrates the relationship between the position of the indicator and the electrical resistance of the motor.

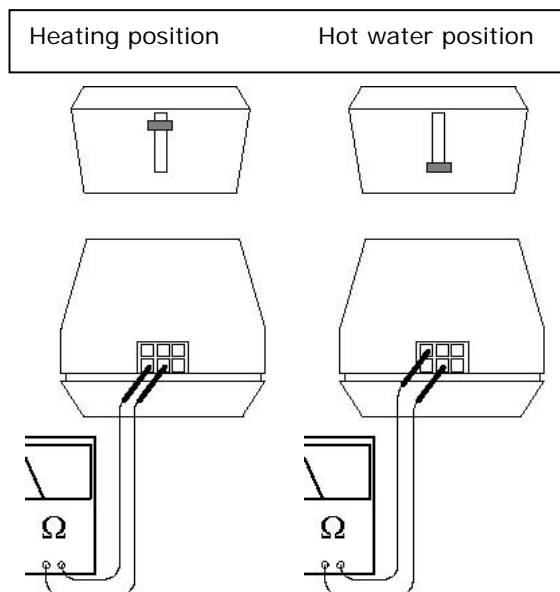



Fig. 23

If the valve is complete the resistance measured will be approx. 8 kOhm.

### F Removal of the motor

 Warning: isolate the boiler from the mains electricity supply before removing any covering or component.

- 1 Remove the cover (section 1.4).
- 2 Release the electrical connector from the motor body.
- 3 Press the push-button B placed in the rear side of the motor body (Fig. 24) and rotate the motor anti-clockwise, releasing it from the hydraulic group.

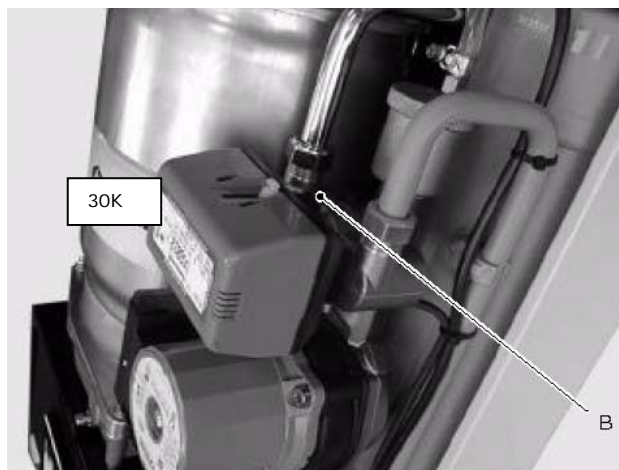



Fig. 24

- 4 Reassemble the motor carrying out the removal operations in reverse order.

**F Check the diverter mechanism**

 **Warning:** isolate the boiler from the mains electricity supply before removing any covering or component.

- 1 Remove the cover (section 1.4) and remove the three way valve motor (see section Removal of the motor).
- 2 Push the stem of the diverter mechanism (Fig. 25) checking that there are no mechanical impediments.

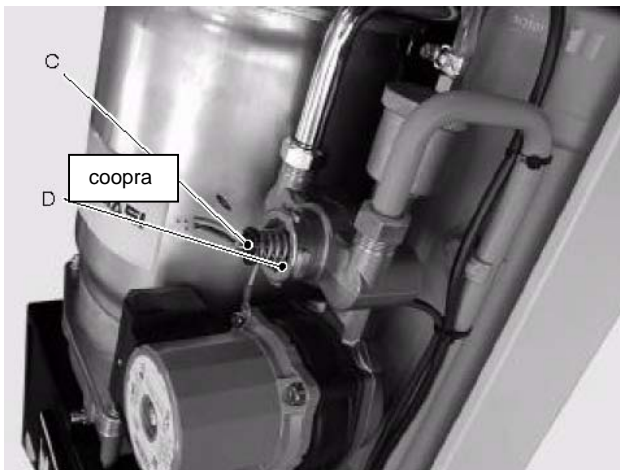




Fig. 25

**F Removal of the diverter mechanism**

 **Warning:** isolate the boiler from the mains electricity supply before removing any covering or component.

- 1 Remove the cover (section 1.4) and remove the motor (see section Removal of the motor).
- 2 Empty the main circuit (section 1.5)
- 3 Unscrew the diverter mechanism D (Fig. 25) by means of the tool provided with the spare part and replace.
- 4 Re-assemble the mechanism carrying out the removal operations in reverse order.

**F Removal of the three way valve body**

 **Warning:** isolate the boiler from the mains electricity supply before removing any covering or component.

- 1 Remove the cover (section 1.4).
- 2 Empty the main circuit (section 1.5)
- 3 Lower the control panel (section 1.7)
- 4 Disconnect the wirings of the diverter valve, pump, return water temperature sensor and main circuit pressure sensor.
- 5 Disconnect the pipe E (fig 26).
- 6 Completely unscrew the connections F, G and H (Fig. 26) and remove the complete hydraulic group.

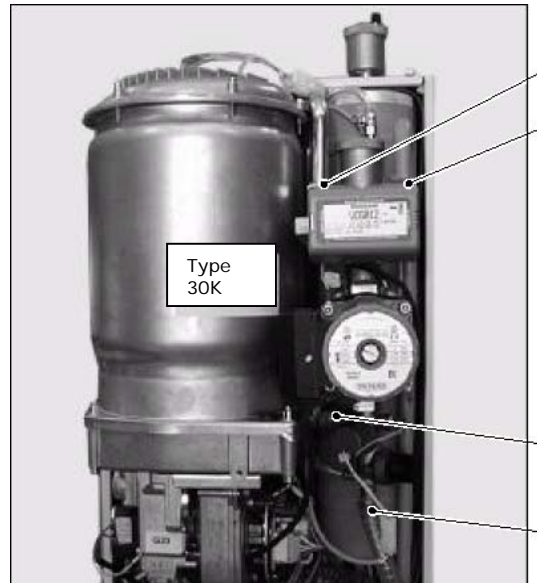


Fig. 26

- 7 Remove the motor (see section Removal of the motor).
- 8 Disconnect the pipe I and remove the automatic air vent J (Fig. 27).
- 9 Remove the pin K and remove the valve body L.
- 10 Re-assemble the parts carrying out the removal operations in reverse order.

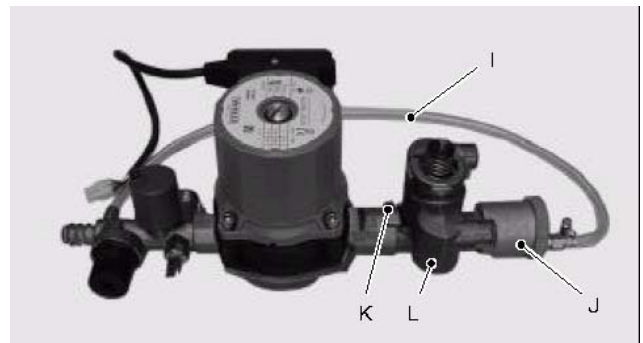



Fig. 27

## 2.9. C.h. pressure relief valve

### F Removal

 Warning: isolate the boiler from the mains electricity supply before removing any covering or component.

- 1 Remove the cover (section 1.4).
- 2 Empty the main circuit (section 1.5)
- 3 Lower the control panel (section 1.7)
- 4 By means of a suitable spanner unscrew and remove the valve A (Fig. 28).
- 5 Re-assemble the sensor following the removal procedures in the reverse order.

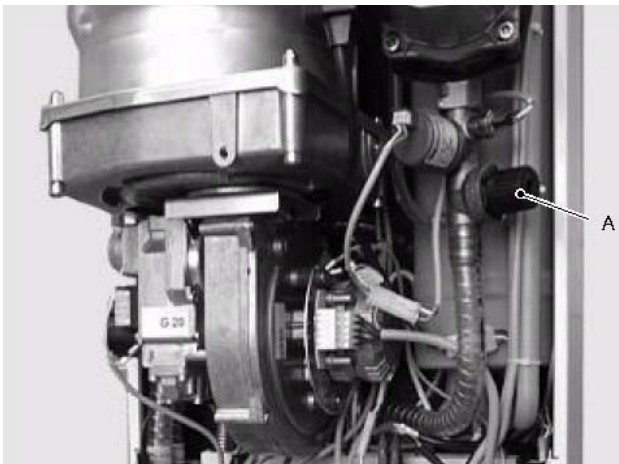


Fig. 28

## 2.10. Electronic control p.c.b.


The fundamental function of the electronic control p.c.b. is that of controlling the boiler in relation to the external needs (i.e. heating the dwelling or heating the water for d.h.w. use) and operating in order to keep the room temperature and the domestic hot water to the desired value.

This is obviously possible within the useful power and maximum working temperature limits foreseen.

The electronic control p.c.b. does also a sequence of operations (ignition cycle) which lead to the ignition of the gas at the burner and checks the presence of the flame during the entire period in which it is activated

Generally, the electronic control p.c.b. receives inlet information coming from the boiler (the sensors) or from the outside (user settings, room thermostat, etc.), processes it and consequently acts with outlet commands on other components of the boiler.

### F Removal

 Warning: isolate the boiler from the mains electricity supply before removing any covering or component.

- 1 Remove the cover (section 1.4).
- 2 Lower the control panel (section 1.7)
- 3 Disconnect all the wirings connected to the p.c.b.
- 4 Unscrew the screws A (Fig. 29) and remove the electronic control p.c.b.
- 5 Re-assemble the electronic control p.c.b. carrying out the removal operations in reverse order.

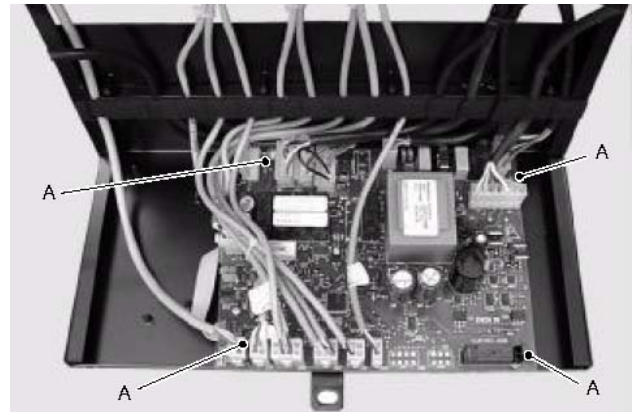



Fig. 29

## 2.11. Display p.c.b.

### F Removal

 Warning: isolate the boiler from the mains electricity supply before removing any covering or component.

- 1 Remove the cover (section 1.4).
- 2 Lower and open the control panel (section 1.7).
- 3 Remove the electronic control p.c.b. as explained in the section 2.10
- 4 Unscrew the screws A (Fig. 30) and remove the display p.c.b.
- 5 Re-assemble the display p.c.b. carrying out the removal operations in reverse order.

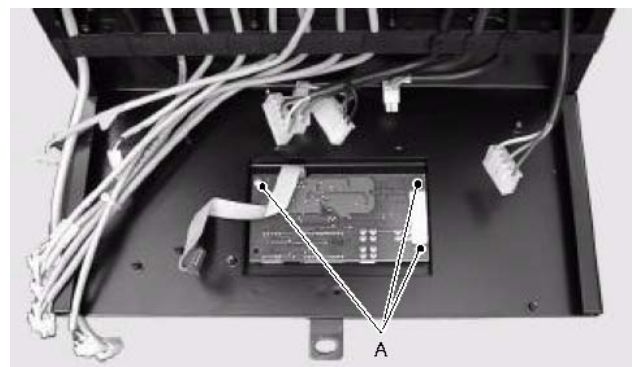



Fig. 30



## 2.12. Glow plug and ionisation rod

### F Removal

 Warning: isolate the boiler from the mains electricity supply before removing any covering or component.

- 1 Remove the cover (section 1.4).
- 2 Disconnect the connector A (glow plug) or B (ionisation rod) (Fig. 31).
- 3 To remove the glow plug unscrew the screw C.
- 4 To remove the ionisation rod unscrew the screws D.
- 5 Re-assemble the component carrying out the removal operations in reverse order.

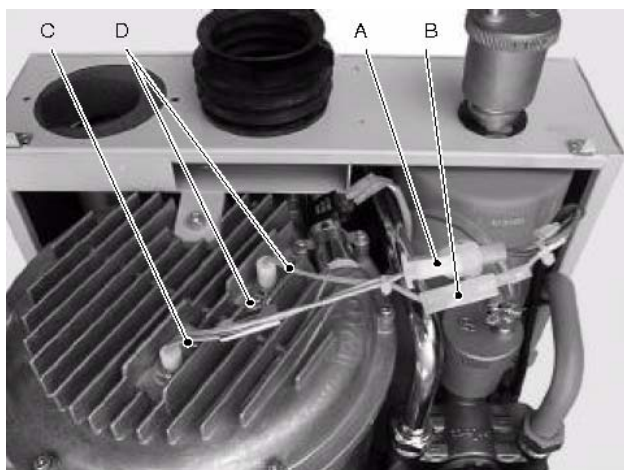



Fig. 31

## 2.13. D.h.w. heat exchanger

During a d.h.w. draw off the d.h.w. heat exchanger allows the instantaneous transfer of heat from the main circuit to the water destined for d.h.w. use.

When there is no draw off, the exchanger works as a small d.h.w. tank and it is kept at the desired temperature (d.h.w. hold temperature) by means of the electronic control system.

### F Removal

 Warning: isolate the boiler from the mains electricity supply before removing any covering or component.

- 1 Remove the cover (section 1.4).
- 2 Empty the main circuit (section 1.5)
- 3 Empty the d.h.w. circuit (section 1.6)
- 4 Unscrew the screws A and move away the plate B (Fig. 32).
- 5 Remove the d.h.w. heat exchanger temperature sensor (section 2.7).
- 6 Unscrew the inlet and outlet domestic water connections C.



Fig. 32

- 7 Lower the control panel (section 1.7).
- 8 Disconnect the wirings of the diverter valve, pump, return water temperature sensor and main circuit pressure sensor.
- 9 Disconnect the pipe D (Fig. 33).
- 10 Completely unscrew the connections E, F and G (Fig. 33) and remove the complete hydraulic group.
- 11 Unscrew and remove the automatic air vent H.

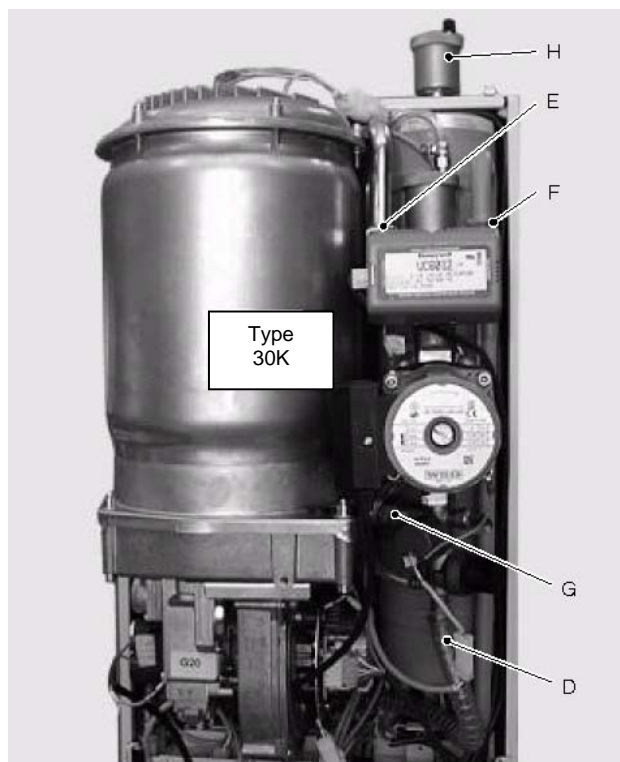


Fig. 33

- 12 Move the lower part of the exchanger towards the front of the boiler and lower it until its top is free from the frame of the boiler.
- 13 Move the top of the exchanger towards the front of the boiler, lift and remove it.
- 14 Re-assemble the exchanger and the other parts carrying out the removal operations in reverse order.



## Chapter 3: FAULT FINDING

### Burner state

|             | stand-by | pre-rinse/pre-heat glowpl | ignition | in operation | post-rinse | pump afterrun      | stand-by |
|-------------|----------|---------------------------|----------|--------------|------------|--------------------|----------|
| heat demand |          |                           |          |              |            |                    |          |
| fan         |          |                           |          |              |            |                    |          |
| gas valve   |          |                           |          |              |            |                    |          |
| glow plug   |          |                           |          |              |            |                    |          |
| ionisation  |          |                           |          |              |            |                    |          |
| pump        |          |                           |          |              |            |                    |          |
|             | 0 sec    | 3 sec                     | 7 sec    | 12 sec       | 22 sec     | end of heat demand |          |

0 sec  6 sec

#### Pump test program (each boiler start)

At each new heat demand the pump is switched, the pre-rinse starts, the glowplug pre-heats, and the static water pressure is measured.

After 3 seconds the pump is switched to high speed and the active water pressure is measured and stored in the software.

If the difference between the active water pressure and the static water pressure is between 0.05 and 0.54 bar (0.64 bar for type 40 and TWIN) a correct water flow through the primary heat exchanger is present and the ignition time starts.

12 sec  22 sec

#### Temperature test (each boiler start)

After ignition the water flow through the heat exchanger is secured by a temperature test of flow / return sensor.

The temperature rise between flow sensor and return sensor must rise more than 3°C within 10 seconds.

If so the regulation is released.

12 sec  end of heat demand

#### Pressure monitoring (during operation)

If the system water pressure changes by more than  $\pm 0.1$  bar ( and  $\pm 0,3$  bar with changing pump speed) within 4 seconds, the regulation blocks and switches over to the pump test program, with a continuous P on the status display.

12 sec  end of heat demand

#### Pump speed regulation (high/low during heating operation)

When the temperature difference between flow and return is greater than 30°C, the pump switches to high speed.

When the temperature difference drops below 10°C, the pump switches back to low speed.

### Static pressure monitoring

The boiler is in working mode when the system water pressure is between 0,5 and 3 bar.

With a water pressure between 0,5 and 0,2 bar, the burner is limited to low load.

If the water pressure is less than 0.2 bar, the regulation locks with a 'P' + 'pressure' on the display.

If the water pressure is greater than 3.0 bar, the regulation locks with a 'P' + 'pressure' on the display.

### 3.1 Stand-by

*(Fan off - Gas valve off - Glow plug off - Ionisation off)*

Heat demand: During the standby, a check is made to see if there is heat demand. If so the boiler will go over to pre-rise.

### 3.3 Ignition

*(Fan on - Gas valve on - Glow plug on/off - Ionisation off/on)*

The ignition sequence of the burner is initiated.

Fan: The fan is running at the ignition speed (2900 rpm).

Gas valve: The gas valve coil is activated and opens the safety valves.

Glow plug: The glow plug ignites the gas/air mixture from the burner.

Ionisation: As soon as an ionisation signal is measured, the glow plug is switched off and the boiler will go over to in operation.

If there is no ionisation signal at the end of the safety time, a new start attempt is made.

After four failed start attempts the boiler runs into lock-out.

### 3.5 Post-rinse

*(Fan on - Gas valve off - Glow plug off - Ionisation off)*

Combustion chamber is being post-ventilated with air.

At end of heat demand the regulation runs into post-rinse.

The fan runs at the last demanded speed for 20 seconds.

### 3.2 Pre-rinse / pre-heat glowplug

*(Fan on - Gas valve off - Glow plug on - Ionisation off)*

Fan: The fan switches over to the purging speed (1350 rpm).

Glow plug: The glow plug is switched on at full power.

Pump test: After the pump test program is met, ignition state starts.

### 3.4 In operation

*(Fan on - Gas valve on - Glow plug off - Ionisation on)*

conditions burner on:

- when the room thermostat is closed (heat demand),
- and when the actual flow temperature is 5°C below the set point,
- and after 3 minutes anti-cycling time, if applicable.

conditions burner off:

- when the room thermostat is open (end of heat demand),
- or when the actual flow temperature is 3°C above the set point,
- or when the actual flow temperature is 3°C above the

### 3.6 Pump afterrun (heating)

*(Fan off - Gas valve off - Glow plug off - Ionisation off)*

The pump continues to run over the heating circuit.

The time is adjustable (minimum of 1 minute with a maximum of CO=24 hours).

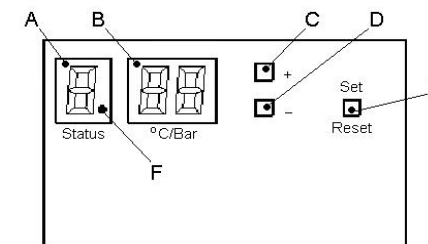
### 3.7 Display

The left segment indicates the Status (or the parameter when being in the menu option)

A dot on the status display indicates that the burner is on.

The two right segments indicate the flow sensor temperature or the system water pressure (or the value of the parameter when being in the menu option).

**A = Status**  
**B = Reading**  
**C = “+” button**  
**D = “-” button**  
**E = Set/Reset**  
**F = Flame**



This boiler is in stand-by mode, waiting for heat demand.

The Status shows a continuous 0, no dot (thus the burner is off).

The two right segments indicate the actual flow sensor temperature of 19°C.

### 3.8 Blocking

The STATUS display shows a **continuous** indication (not flashing).

The boiler operation is stopped due to a minor incorrect operation of the boiler or faulty component.

Most blocking actions restore automatically in time when the conditions return within certain requirements.

Some blocking operations need a reset of the 230V supply power or must be repaired.

Note that each blocking operation will stay at least with 3 minutes anti-cycling time.

### 3.9 Lock-out

The STATUS display shows a **flashing** indication.

The boiler operation is stopped due to a major incorrect operation of the boiler or faulty component

The pump runs over the heating circuit (24 hours).

At some lock-outs, the fan runs post-rinse for 1 minute.

Most lock-out operations can be restored by pressing the 'Set/Reset' button once.

Note that some lock-out operations need a reset of the 230V supply power.

### 3.10 STATUS INDICATIONS



#### High voltage!

The wiring of the pump, the three-way valve, fan and wiring of the gas block can be under a voltage of 230 VAC

each burner start (after the pump test program), the boiler is doing a temperature test. The flow sensor must rise by 3°C more than the return sensor, within the first 20 seconds. if the difference is not made, the boiler will make a re-start. After three failed re-starts, within one heat demand, boiler runs into lock-out

mostly, this lock-out is related to a water flow problem

1  
flashing

boiler does not pass temperature test

check both flow and return sensors for function

use view option in menu mode

test sensor (R=12 kOhm@25°C)

replace sensor

obstruction in water water circuit (flow or return)

open (thermostatic) valves or zone systems

install a differential bypass valve between flow and return

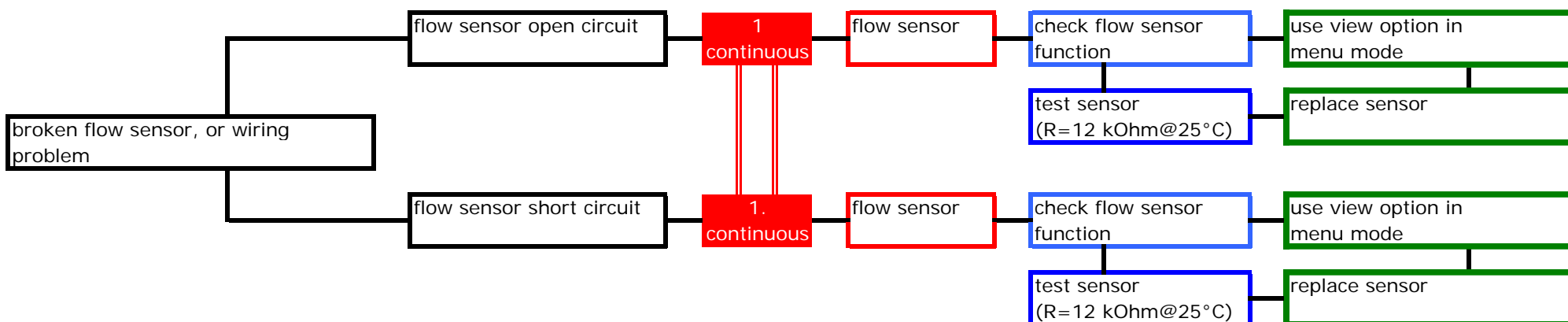
check flow of water through heat exchanger

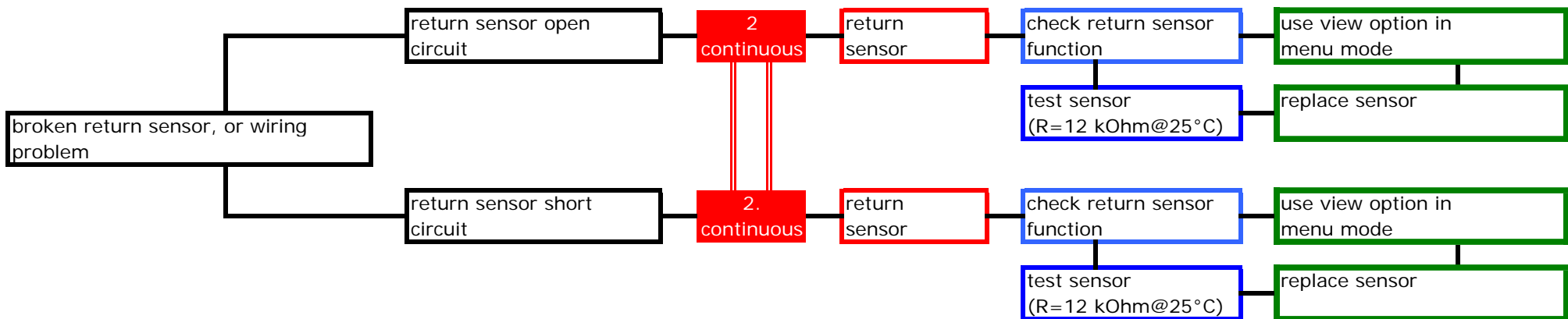
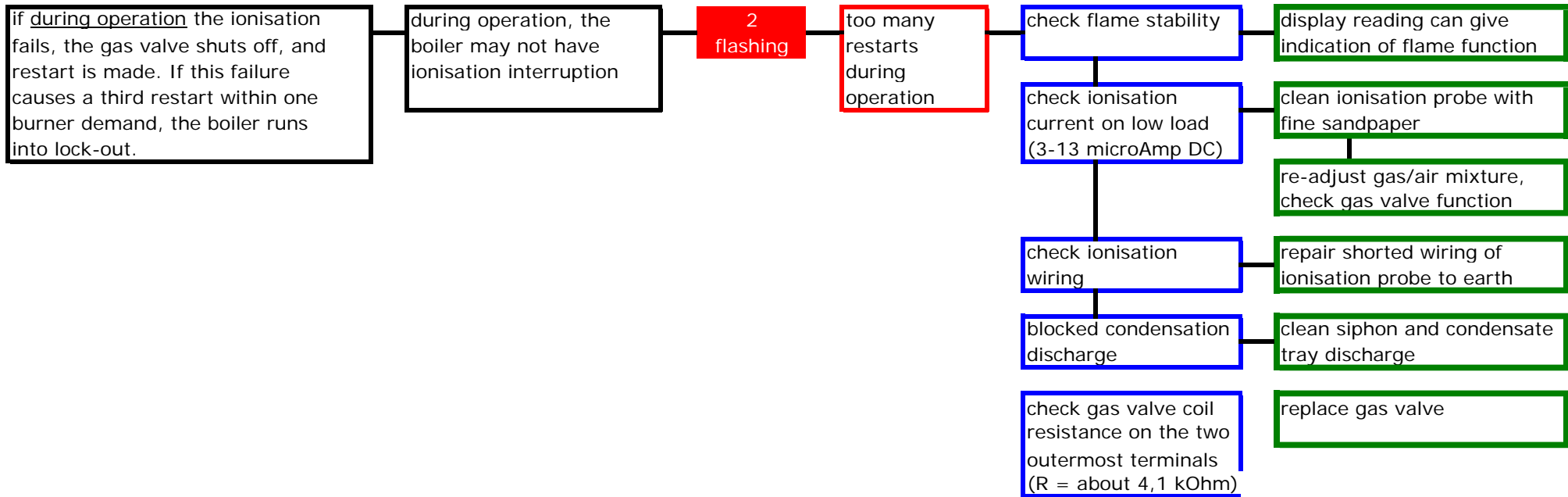
#### Reset the appliance.

Press the "+" button for 5-10 seconds, the status 8 comes up (water pressure)

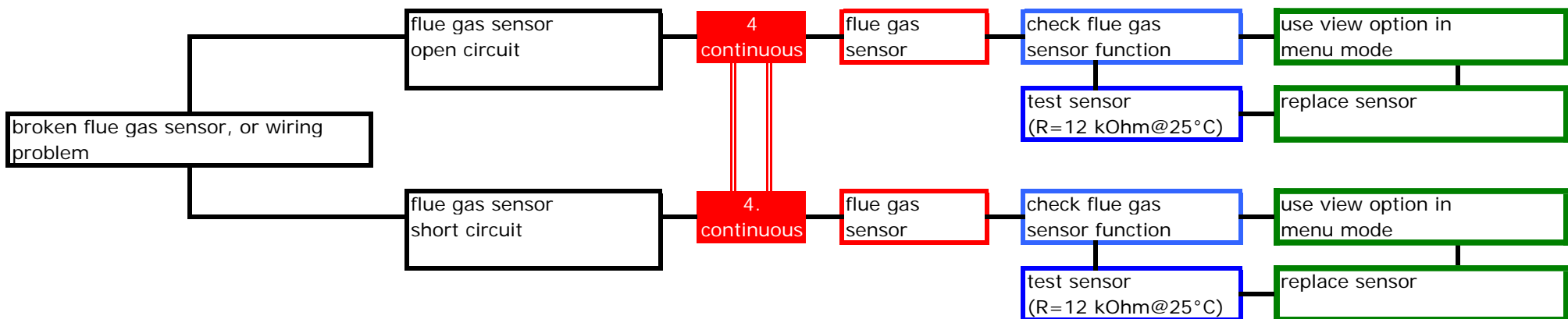
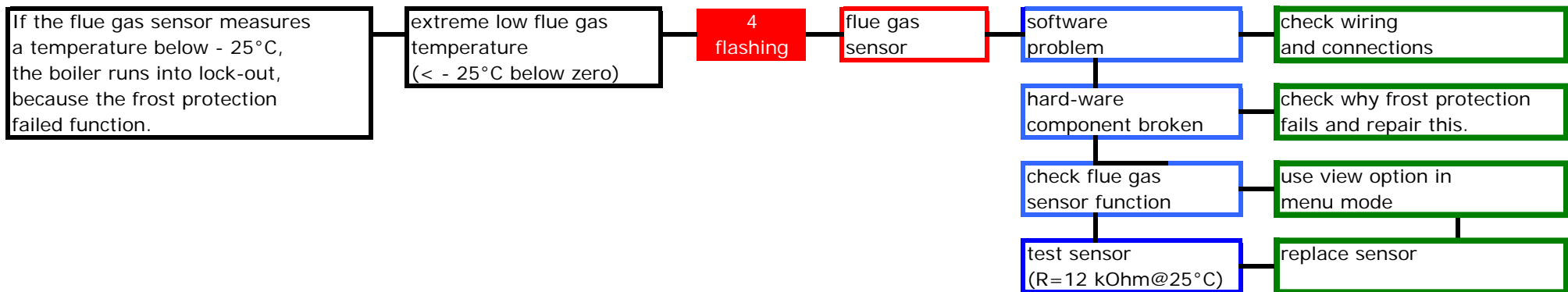
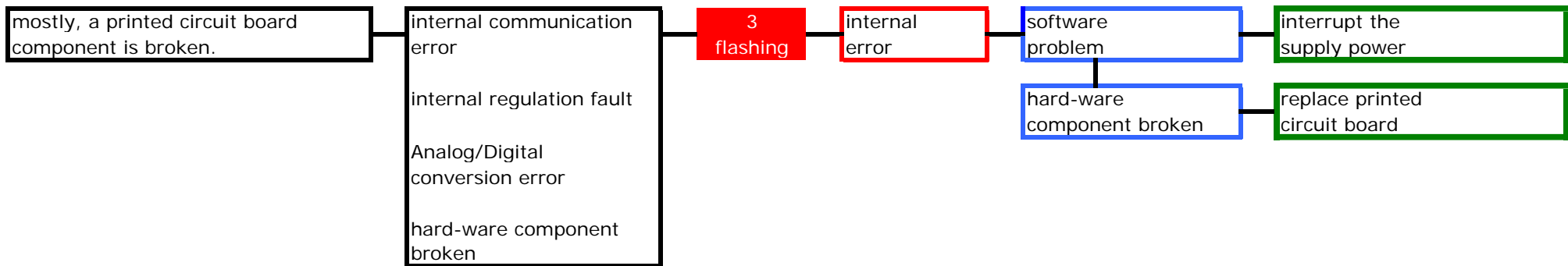
Start demand for heat with the chimney sweeper function. Read the pressures.

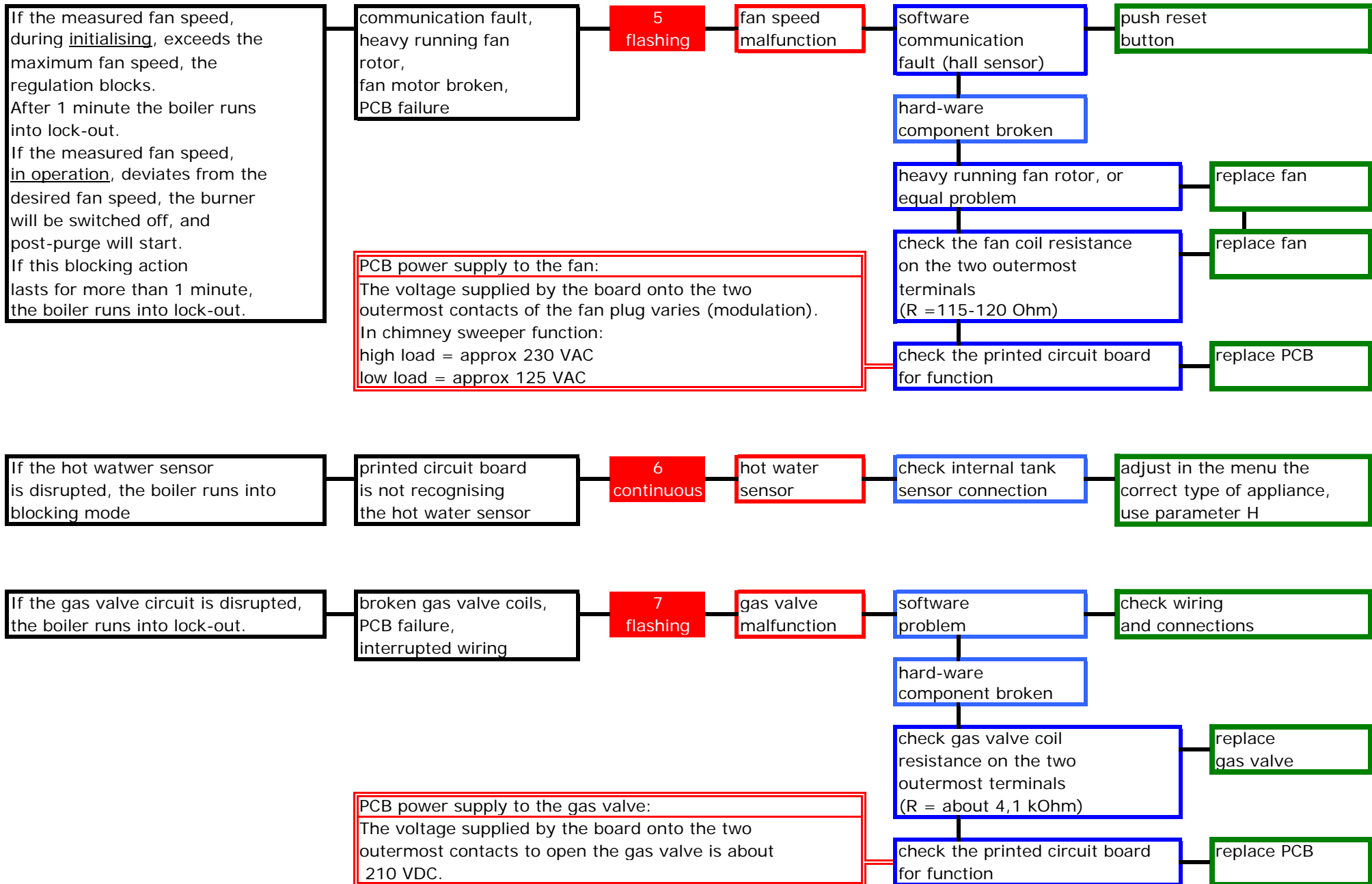
- if the delta P is under 0,05 bar, the boiler has no water.
- if the delta P is above 0,54 bar (0,64 for type 40 and TWIN), the water does not flow.
- If the delta is between 0,05 and 0,54 (0,64 for type 40 and TWIN), the water flow is all right, the pump test ends.

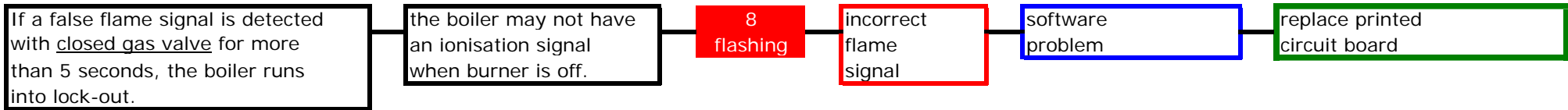




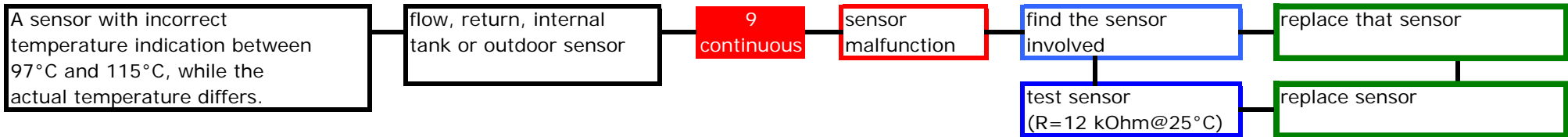
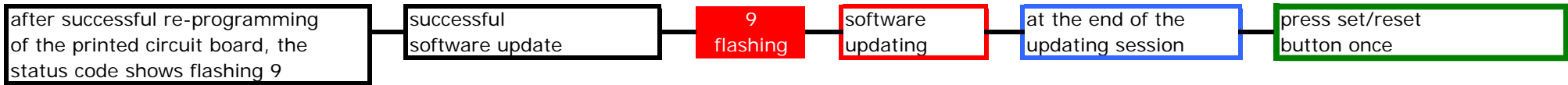


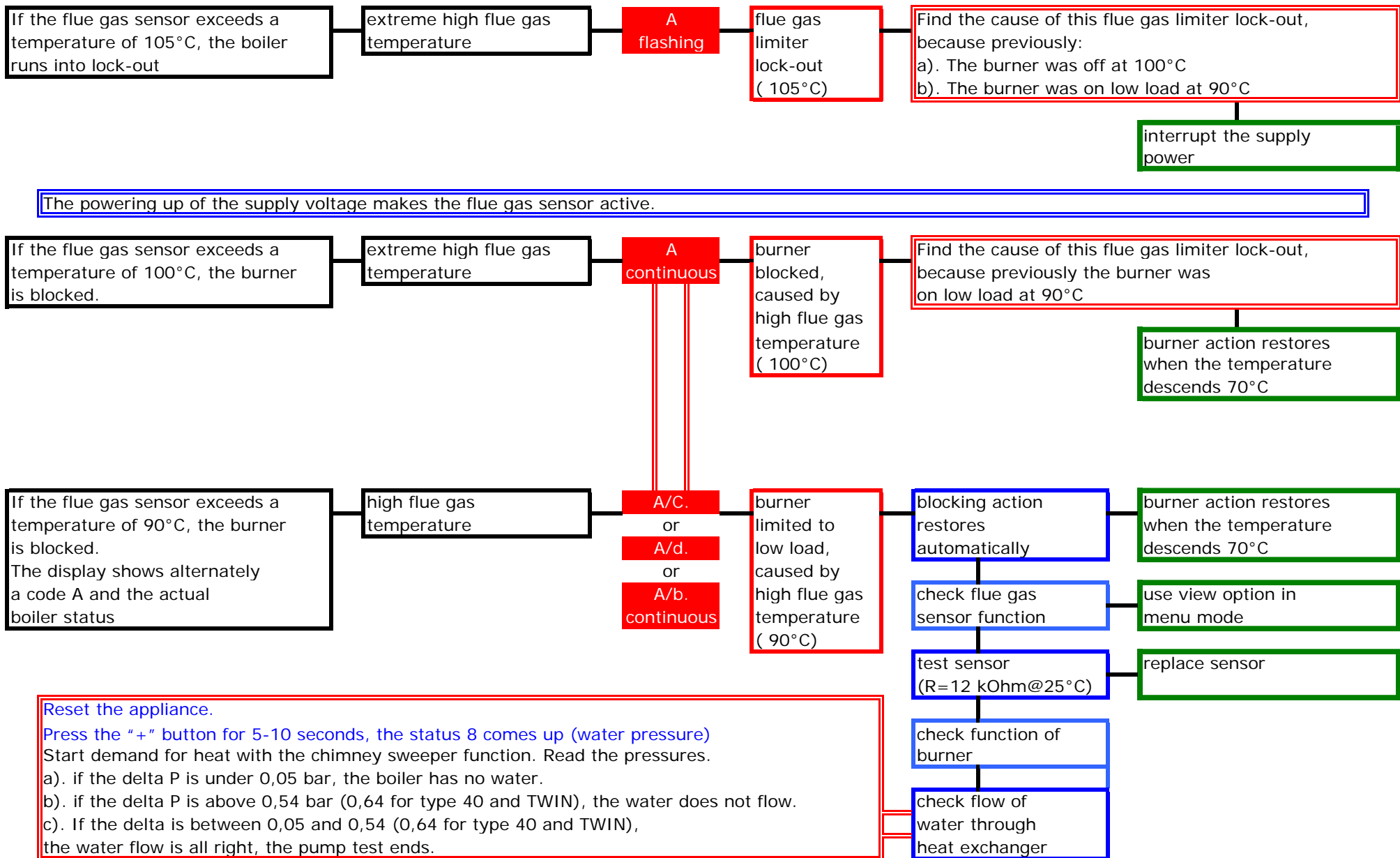


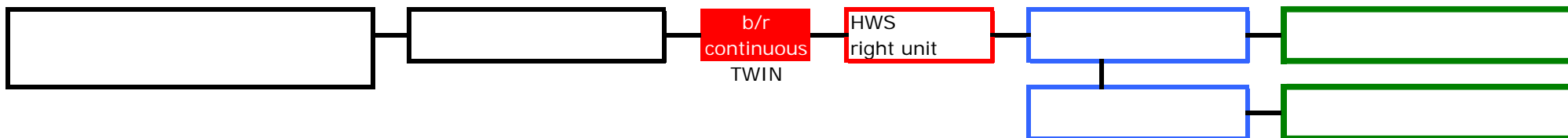




If a false flame signal is detected during pre-rinse / post-rinse, the regulation blocks. If the false flame signal lasts for more than 5 sec, the boiler runs into lock-out.







### Chimney sweeper function

Start the chimney sweeper function by pressing the + and - buttons of the display simultaneously for at least 5 to 10 seconds.

The chimney sweeper function overruns the central heating regulation (not hot water regulation).

The status shows a flashing C and the two right segments show the ionisation current in microamperes DC.



temporarily display  
for service purposes

C  
flashing

chimney  
sweeper  
function


press the "+" or "-"  
button for high or low  
load

chimney sweeper function  
removes automatically  
after 10 minutes  
or  
by pressing the "-" button


Enter the chimney sweeper function  
by pressing both the "+" and "-"  
buttons simultaneously for  
5 - 10 seconds

The two right segments  
show the actual ionisation current  
in micro Amps DC

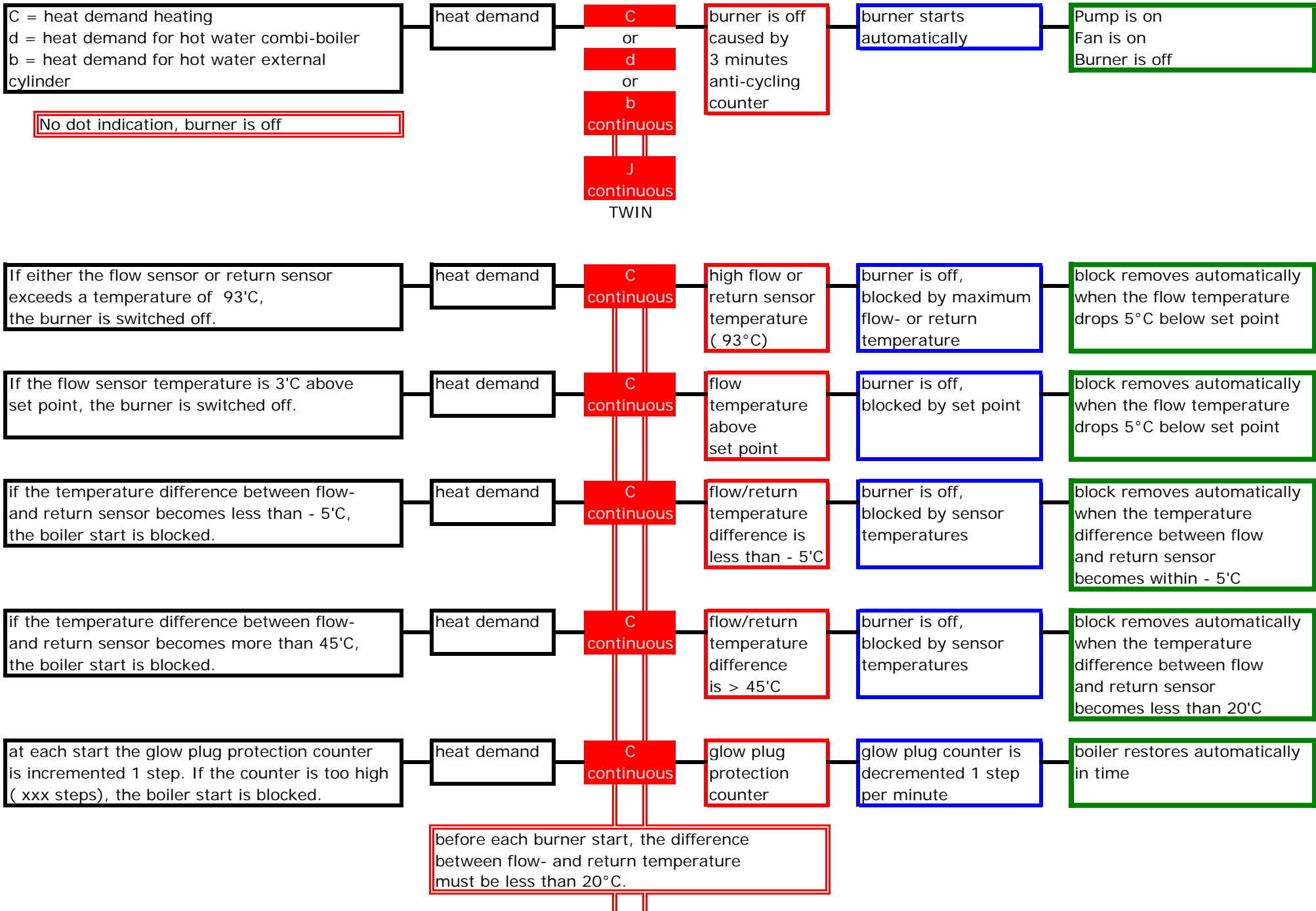


 = high load



 = low load





C. = heat demand heating  
 d. = heat demand for hot water combi-boiler  
 b. = heat demand for hot water external cylinder

The dot indicates the burner is on.

heat demand

C.  
or  
d.  
or  
b.  
continuous

boiler is in heating mode

burner modulates, depending the amount of heat required.

Pump on, Fan on, Burner on

at the end of heat demand, the contacts of the green connector, ports 1 and 2, are open.

end of heat demand ( Heating)

c  
continuous

pump afterrun heating

post-rinse time is adjustable in menu ( Letter O)

pump stops automatically after post-rinse time.

software or hard-ware problem, the boiler runs into lock-out for safety reasons

internal interlock fault

E  
flashing

internal lock-out

software problem

interrupt the supply power

hard-ware component broken

replace printed circuit board

E  
continuous  
TWIN

no slave recognised

At each burner start, while the fan runs on the ignition speed of 2700 rpm, the gas valve opens and a flammable gas/air mixture is supplied to the burner. The glow plug ignites the gas/air mixture at the surface of the burner. If there is insufficient ionisation current at the end of the safety time, a new start attempt will be made. After four failed consecutive start attempts, the boiler runs into lock-out.

too many start attempts, during one heat demand, successively

**F**  
flashing

boiler does not start (four failed consecutive attempts)

NO GAS SUPPLY  
gas valve failure

open gas cocks in supply line

gas inlet pressure is too high, (> 60 mbar). The safety valves can not open against high inlet pressure

reduce gas inlet pressure

NO IGNITION  
glow plug

check resistance glow plug (1 - 1,4 kOhm)

the life time of the glow plug is depending on the number of starts and on high mains voltage supply

replace glow plug

NO FLAME  
gas/air mixture

check ionisation current (low load 3-13 micro Amp)

No flame building.  
The gas/air mixture is not set correctly for the type of gas

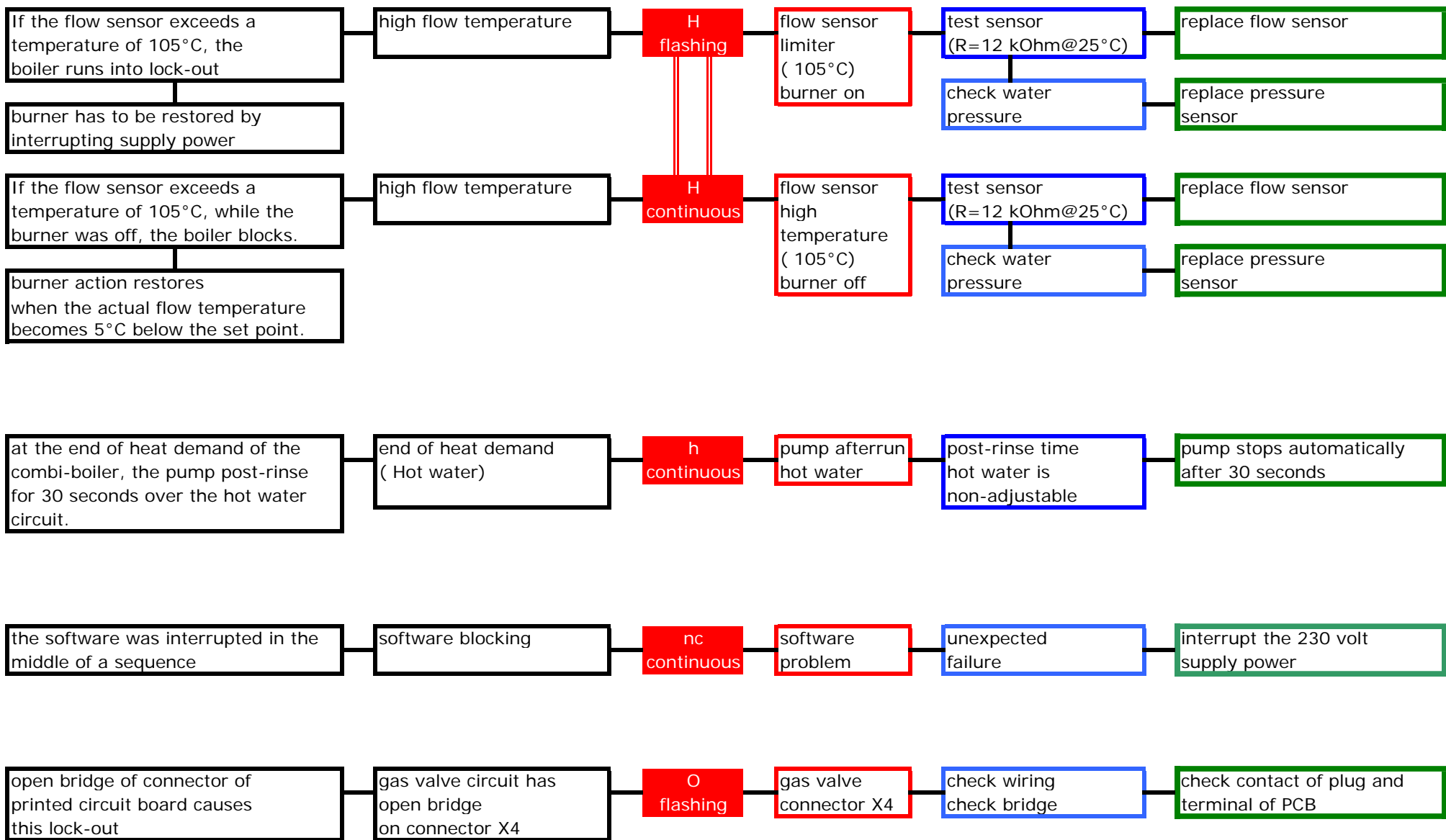
adjustment full / low load

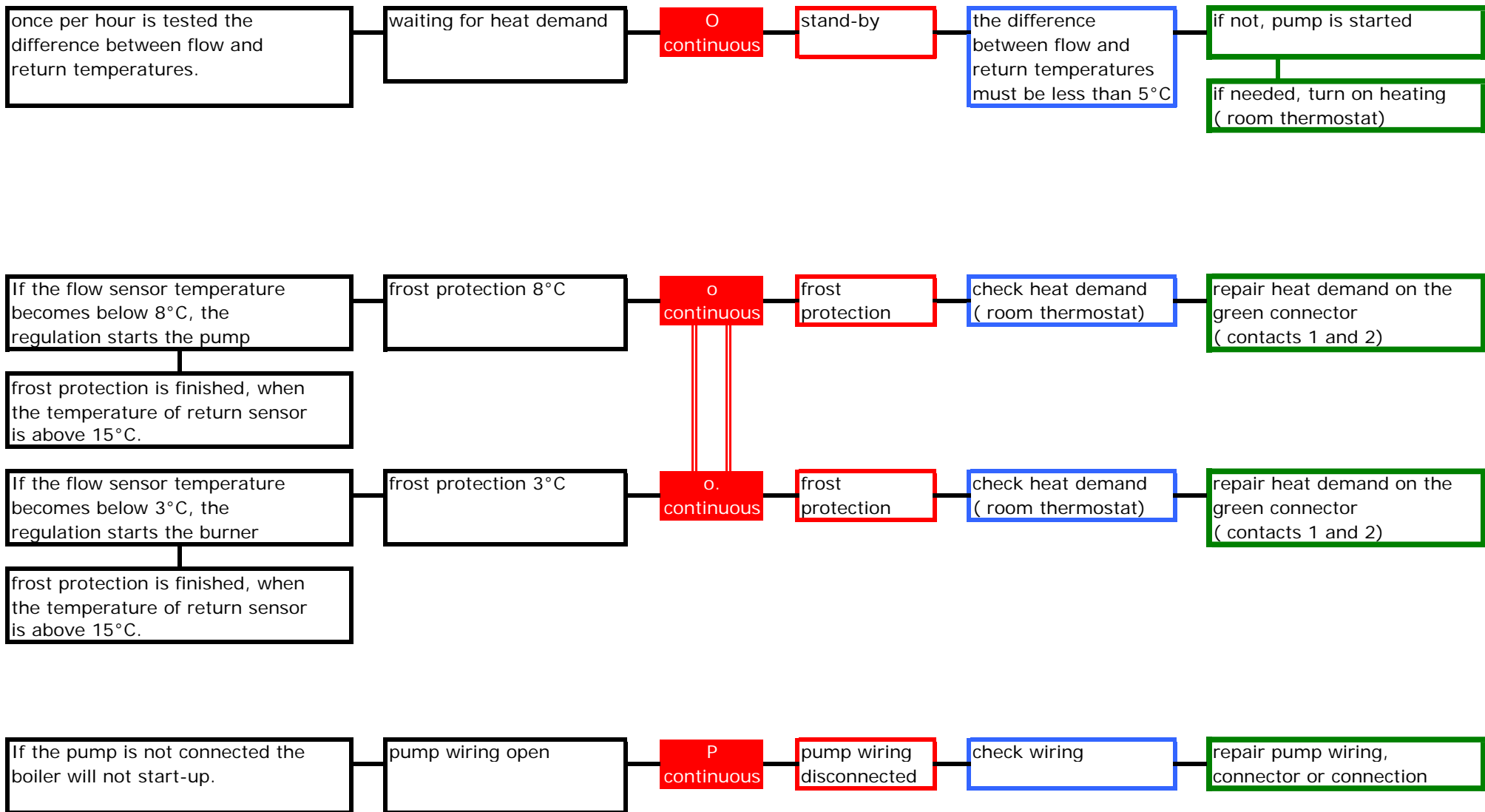
NO IONISATION  
no current

check wiring, remove short circuit to earth

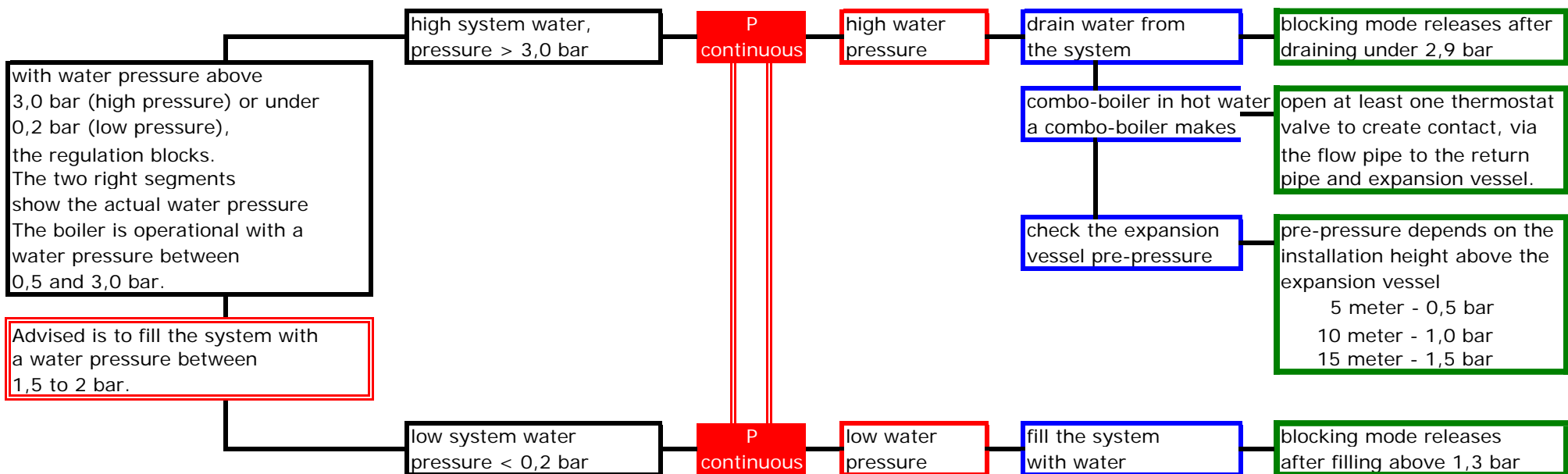
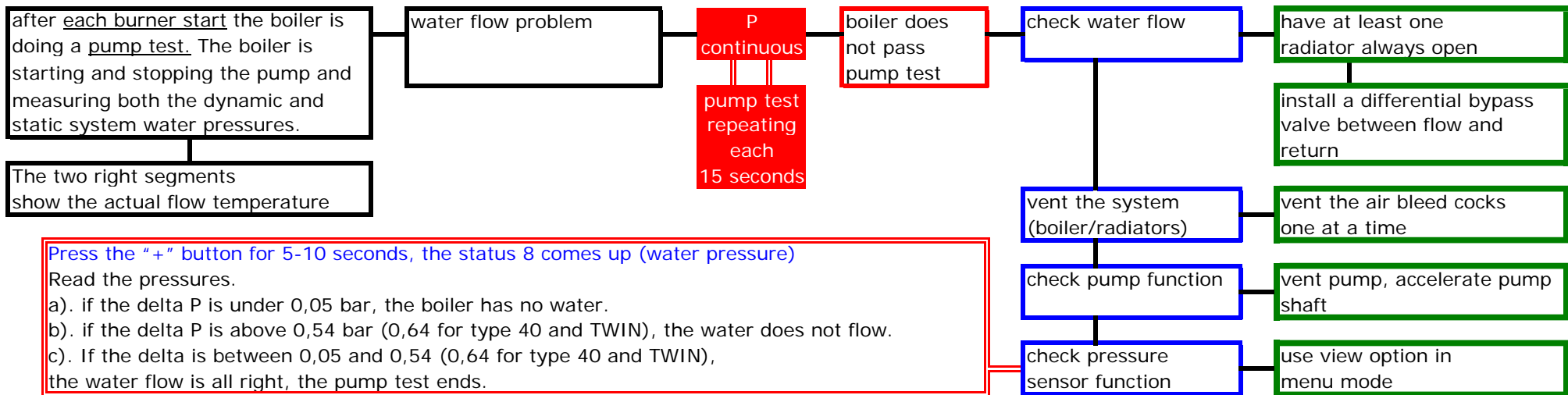
with high temperature flame, an insulating layer can be formed on the probe

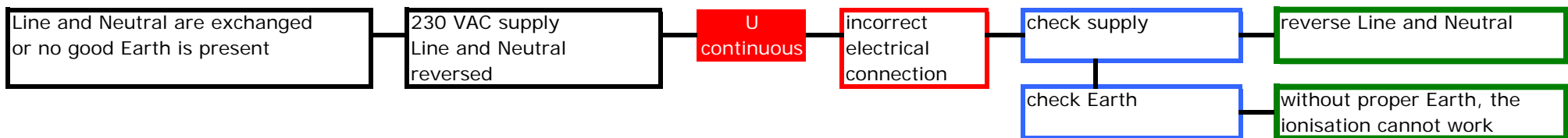
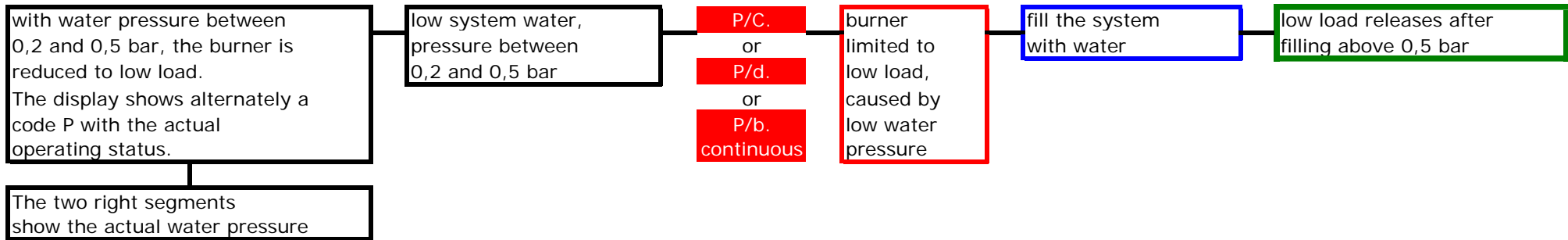
remove dirt with fine sandpaper











**Water pressure**

**Reading water pressure**

**Filling**

**Emptying**

**Air**

**Venting**



2006 Coopra Advanced Heating Technologies b.v.

All rights reserved.

Nothing from this document may be duplicated and/or made public by means of printing, photocopy, microfilm or in any other way without prior written permission from the manufacturer. This also applies to the appropriate drawings and/or diagrams.

The information supplied in this document is based on general data with regard to constructions, material characteristics and working methods known at the time of going to print. Therefore, we reserve the right to make changes without notification. For this reason, the instructions given serve only as a guideline for the installation, use and maintenance of the unit shown on the cover of this document.

This document is valid for the unit in its standard version. Therefore, the manufacturer cannot be held liable for any damage arising from specifications that deviate from the standard version of the unit delivered to you.

This document has been compiled with all possible care. However, the manufacturer cannot be held liable for any mistakes in this document or for any consequences.

Take the time to read this document carefully before installing or using the unit. Always keep this document near the unit.